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APPLICATION NO.	FILING DATE	FIRST NAMED INVENTOR	ATTORNEY DOCKET NO.	CONFIRMATION NO.
10/666,331	09/17/2003	Hong Shih	LMRX-P023/P1130	8374

32986 7590 08/07/2007

IPSG, P.C.
P.O. BOX 700640
SAN JOSE, CA 95170

EXAMINER	
KORNAKOV, MIKHAIL	
ART UNIT	**PAPER NUMBER**
1746	
MAIL DATE	**DELIVERY MODE**
08/07/2007	PAPER

Please find below and/or attached an Office communication concerning this application or proceeding.

The time period for reply, if any, is set in the attached communication.

Office Action Summary	Application No.	Applicant(s)	
	10/666,331	SHIH ET AL.	
	Examiner	Art Unit	
	Michael Kornakov	1746	

-- The MAILING DATE of this communication appears on the cover sheet with the correspondence address --

Period for Reply

A SHORTENED STATUTORY PERIOD FOR REPLY IS SET TO EXPIRE 3 MONTH(S) OR THIRTY (30) DAYS, WHICHEVER IS LONGER, FROM THE MAILING DATE OF THIS COMMUNICATION.

- Extensions of time may be available under the provisions of 37 CFR 1.136(a). In no event, however, may a reply be timely filed after SIX (6) MONTHS from the mailing date of this communication.
- If NO period for reply is specified above, the maximum statutory period will apply and will expire SIX (6) MONTHS from the mailing date of this communication.
- Failure to reply within the set or extended period for reply will, by statute, cause the application to become ABANDONED (35 U.S.C. § 133). Any reply received by the Office later than three months after the mailing date of this communication, even if timely filed, may reduce any earned patent term adjustment. See 37 CFR 1.704(b).

Status

1)☒ Responsive to communication(s) filed on *11 June 2007*.

2a)☒ This action is **FINAL**. 2b)☐ This action is non-final.

3)☐ Since this application is in condition for allowance except for formal matters, prosecution as to the merits is closed in accordance with the practice under *Ex parte Quayle*, 1935 C.D. 11, 453 O.G. 213.

Disposition of Claims

4)☒ Claim(s) *1,2,4-44 and 46-58* is/are pending in the application.

4a) Of the above claim(s) *34-37 and 55-58* is/are withdrawn from consideration.

5)☐ Claim(s) _____ is/are allowed.

6)☒ Claim(s) *1,2,4-33,38-44 and 46-54* is/are rejected.

7)☐ Claim(s) _____ is/are objected to.

8)☐ Claim(s) _____ are subject to restriction and/or election requirement.

Application Papers

9)☐ The specification is objected to by the Examiner.

10)☐ The drawing(s) filed on _____ is/are: a)☐ accepted or b)☐ objected to by the Examiner.

Applicant may not request that any objection to the drawing(s) be held in abeyance. See 37 CFR 1.85(a).

Replacement drawing sheet(s) including the correction is required if the drawing(s) is objected to. See 37 CFR 1.121(d).

11)☐ The oath or declaration is objected to by the Examiner. Note the attached Office Action or form PTO-152.

Priority under 35 U.S.C. § 119

12)☐ Acknowledgment is made of a claim for foreign priority under 35 U.S.C. § 119(a)-(d) or (f).

a)☐ All b)☐ Some * c)☐ None of:

1.☐ Certified copies of the priority documents have been received.

2.☐ Certified copies of the priority documents have been received in Application No. _____.

3.☐ Copies of the certified copies of the priority documents have been received in this National Stage application from the International Bureau (PCT Rule 17.2(a)).

* See the attached detailed Office action for a list of the certified copies not received.

Attachment(s)

1) ☒ Notice of References Cited (PTO-892)
2) ☐ Notice of Draftsperson's Patent Drawing Review (PTO-948)
3) ☐ Information Disclosure Statement(s) (PTO/SB/08) Paper No(s)/Mail Date _____.
4) ☐ Interview Summary (PTO-413) Paper No(s)/Mail Date. _____.
5) ☐ Notice of Informal Patent Application
6) ☐ Other: _____.

DETAILED ACTION

1. Applicants' amendment to specification and claims have overcome objections, as well as 112 first and second paragraph rejections, and thus these objections and rejections are withdrawn.

2. Claims 3, 45 are cancelled by Applicants' amendment. Claims 1, 2, 4-44, 46-58 are pending. Claims 34-37, 55-58 are withdrawn. Claims 1, 2, 4-33, 38-44, 46-54 are currently examined on the merits.

3. The text of those sections of Title 35, U.S. Code not included in this action can be found in a prior Office action.

4. Claims 1, 2, 4-21, 26-33, 38, 39, 44, 46-54 are rejected under 35 U.S.C. 103(a) as being unpatentable over Shih et al (U.S. 20030190870) in view of Han et al (U.S. 6,942,929) and in further view of Collins et al (U.S. 6,814,814).

Shih teaches cleaning ceramic surfaces of parts used in semiconductor processing equipment. The teaching of Shih includes treating the parts with oxidizing solution including H_2O_2 (0015 or 0032) (reads on "a first solution", as claimed; treating the parts with acetone and a brush (0032) (reads on "a second solution", as claimed; treating the parts with a first set of acids, including HF (0033) (reads on "a third solution", as claimed).

Shih does not specifically indicate that ceramic surfaces include yttrium oxide, as recited in the preamble of the instant claim 1. However, a preamble is generally not

accorded any patentable weight where it merely recites the purpose of a process, and where the body of the claim does not depend on the preamble for completeness but, instead, the process steps or structural limitations are able to stand alone, consult ***In re Hirao***, 535 F.2d 67, 190 USPQ 15 (CCPA 1976). Besides, it is noted that chamber parts are conventionally covered with ceramic coating of yttrium oxide in order to better protect the chamber parts from corrosion, as evidenced by Han (col. 1, lines 35-40; col.4, lines 43-50). Therefore, the presence of ceramic having yttrium oxide is reasonably expected within the teaching of Shih.

Shih also remains silent about mechanically rubbing a surface of the part while treating it with oxidizing solution and with a first set of acids (third solution). However, scrubbing or rubbing or wiping chamber surfaces during wet cleaning is conventionally utilized in the art, as indicated by, for example by Collins, who teaches that "residues are periodically cleaned off the chamber surfaces to reduce or prevent contamination of the substrate. The chamber may be cleaned by a wet-cleaning process in which the chamber is shut down and an operator scrubs or wipes the chamber walls with an acid or solvent" (col. 1, lines 27-35). Therefore, one skilled in the art motivated by the general teaching of Collins would have found obvious to utilize mechanical scrubbing in order to efficiently clean ceramic parts with oxidizing or acidic processing solutions in the teaching of Shih.

With regard to claim 1, abrasive pads are conventionally utilized for scrubbing and one skilled in the art would have found obvious to use such pad as the scrubbing tool in the teaching of Shih/Collins.

With regard to claims 2, Shih teaches treating parts with the second set of acids (0033) (reads on "a fourth solution", as claimed). Shih also teaches treatment with alkaline solution, which includes NH_4OH. Shih specifically indicates that treatment with NH_4OH may be useful in removing metal contaminants (0015). Shih also indicates that chemical steps in his cleaning routine may further include or be replaced with the other chemical steps depending on the nature of contaminants to be removed (0031).

With regard to claims 4-6, 8-20 Shih teaches rinsing parts with DI water and drying with filtered nitrogen upon cleaning with particular chemical (Fig. 2, Fig. 3).

With regard to claim 7, which recites cleaning set of structures ultrasonically, it is noted that ultrasonically enhanced cleaning/rinsing is conventionally utilized in the art and one skilled in the art would have found obvious to enhance cleaning of parts by applying ultrasonic waves to the acetone containing solution of Shih.

With regard to the limitations, reciting particular processing parameters, such as treatment time and concentrations of treatment solutions, Shih teaches that relative amounts of chemical ingredients and the length of time of the dip may be determined routinely by one of ordinary skill in the art (0015, 0016, 0017). Since the criticalities of recited parameters are not shown on this record, one skilled in the art would have found obvious to optimize treatment time and concentrations of treatment solutions as suggested by Shih in order to provide efficient treatment of ceramic parts in the teaching of Shih.

With regard to claim 29, Shih teaches the use of acidic solution in combination with H_2O_2 (0031, 0033) and that the processing steps can be replaced. Therefore, presence

of H_2O_2 in the first set of acids or in the third cleaning solution, as recited, is expected within the teaching of Shih.

5. Claims 40-43 are rejected under 35 U.S.C. 103(a) as being unpatentable over Shih et al (U.S. 20030190870) in view of Han et al (U.S. 6,942,929), in view of Collins et al (U.S. 6,814,814) and in further view of Amai et al (U.S. 7,063,094).

Shih teaches the use of HNO_3 in the second set of acids. Shih remains silent about the use of CH_3COOH in the second set of acids. Amai teaches that foreign substances on the interior surfaces of the chamber can be dissolved by nitric or acetic acid, thus recognizing equivalency between nitric and acetic acid for similar purposes. However, substitution of equivalent methods requires no express motivation, as long as the prior art recognizes equivalency, ***In re Fount*** 213 USPQ 532 (CCPA 1982); ***In re Siebentritt*** 152 USPQ 618 (CCPA 1967); ***Graver Tank & Mfg. Co. Inc. V. Linde Air products Co***. 85 USPQ 328 (USSC 1950). With regard to particular concentration of acetic acid in the second set of acids, since the criticality of recited concentrations is not shown on this record, one skilled in the art would have found obvious to optimize such concentrations in order to provide efficient treatment of ceramic parts in the teaching of Shih.

6. Claims 22-25 are rejected under 35 U.S.C. 103(a) as being unpatentable over Shih et al (U.S. 20030190870) in view of Han et al (U.S. 6,942,929), in further view of Collins et al (U.S. 6,814,814) and in view of Chen et al (U.S. 6,162,738) and Yu (U.S. 6,514,875).

While teaching treatment of parts with acetone (second solution, as claimed), Shih remains silent about acetone solution comprising H_2O_2. It is noted that the instant specification does not disclose the processing step, wherein such solution is applied. Nevertheless, since the use of acetone for the removal of organic contaminations is known in the industry, as indicated, for example by Yu (col.2, lines 41-43) and since the use of H_2O_2 for the removal of organic contaminants is also known in the industry, as indicated, for example, by Chen (col.7, lines 33-37), one skilled in the art would have found obvious to add H_2O_2 to acetone containing solution of Shih since it is prima facie obvious to combine two compositions each of which is taught by the prior art to be useful for the same purpose, in order to form a third composition to be used for the very same purpose. Consult ***In re Kerkhoven***, 626 F.2d 846, 850, 205 USPQ 1069, 1072 (CCPA 1980) See also ***In re Crockett***, 279 F.2d 274, 126 USPQ 186 (CCPA 1960) and ***Ex parte Quadranti***, 25 USPQ2d 1071 (Bd. Pat. App. & Inter. 1992).

Response to Arguments

7. Applicant's arguments filed 06/11/2007 have been fully considered but they are not persuasive. Applicants' arguments reside in contention that Shih teaches away from the rubbing step, because the process of Shih is purely chemical. This is not found persuasive, because in the paragraph recited by Applicants (0032) Shih does not restrict the use of any scrubbing/rubbing technique. Furthermore, Collins teaches scrubbing the chamber walls using a solvent. Since scrubbing and solvents are conventionally utilized for cleaning apparatus parts, the use of scrubbing with oxidizing

solutions is also predictable within the teaching of Shih/Collins. Applicants' attention is also drawn to the known chamber cleaning technique, illustrated by Satoh et al (U.S. 6,435,196, col.2, lines 35-40), wherein a device is disassembled and each part is dipped in a mixture of hydrogen peroxide solution and ammonia water, contaminants are manually shaved off by mechanical use of sandpaper or a wire brush. The reference to Satoh is not used for the rejection of claim 1, but only to provide an additional evidence that oxidizing solutions are conventionally used with scrubbing while cleaning structures of processing systems.

9. **THIS ACTION IS MADE FINAL.** Applicant is reminded of the extension of time policy as set forth in 37 CFR 1.136(a).

A shortened statutory period for reply to this final action is set to expire THREE MONTHS from the mailing date of this action. In the event a first reply is filed within TWO MONTHS of the mailing date of this final action and the advisory action is not mailed until after the end of the THREE-MONTH shortened statutory period, then the shortened statutory period will expire on the date the advisory action is mailed, and any extension fee pursuant to 37 CFR 1.136(a) will be calculated from the mailing date of the advisory action. In no event, however, will the statutory period for reply expire later than SIX MONTHS from the mailing date of this final action.

Any inquiry concerning this communication or earlier communications from the examiner should be directed to Michael Kornakov whose telephone number is (571) 272-1303. The examiner can normally be reached on 9:00am - 5:30pm.

If attempts to reach the examiner by telephone are unsuccessful, the examiner's supervisor, Michael Barr can be reached on (571) 272-1414. The fax phone number for the organization where this application or proceeding is assigned is 571-273-8300.

Information regarding the status of an application may be obtained from the Patent Application Information Retrieval (PAIR) system. Status information for published applications may be obtained from either Private PAIR or Public PAIR. Status information for unpublished applications is available through Private PAIR only. For more information about the PAIR system, see http://pair-direct.uspto.gov. Should you have questions on access to the Private PAIR system, contact the Electronic Business Center (EBC) at 866-217-9197 (toll-free). If you would like assistance from a USPTO Customer Service Representative or access to the automated information system, call 800-786-9199 (IN USA OR CANADA) or 571-272-1000.

M. Kornakov

Michael Kornakov
Primary Examiner
Art Unit 1746

08/04/2006